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EXAMINER

OH, TAYLOR V

ART UNIT

PAPER NUMBER

1625

DATE MAILED: 01/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/070,740

Applicant(s)

KATO ET AL.

Examiner

Taylor Victor Oh

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

The Status of Claims:

Claims 1-12 are pending.

Claims 1-12 are rejected.

***Claim Rejections - 35 USC § 112***

Claims 5-6, 8-10 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for monoalcohols, such as ethanol, methanol, and etc., does not reasonably provide enablement for all the monoalcohols. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to include all the monoalcohols unrelated to the invention commensurate in scope with these claims. Therefore, an appropriate correction is required. Furthermore, there are "foreman factors or Wands factors" regarding unpredictability because monoalcohols may include any heterocyclic monoalcohols, any aromatic monoalcohols, any alicyclic monoalcohols, and a diverse scope of acyclic monoalcohols. Moreover, as the molecular weight varies substantially, therefore, not all monoalcohols are liquid and also more than routine experimentation is involved. See In re Armbruster 185 USPQ 204 (CCPA 1985) and Angstadt et al., 190 USPQ 152 (CCPA 1990).

The specification, while being enabling for a basic substance, such as sodium carbonate, potassium carbonate, magnesium carbonate, barium carbonate, lithium carbonate, sodium hydroxide, and etc., does not reasonably provide enablement for all

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the basic substances. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to include all the basic substances unrelated to the invention commensurate in scope with these claims.

Therefore, an appropriate correction is required. Furthermore, there are "foreman factors or Wands factors" regarding unpredictability because a basic substance may includes any heterocyclic basic compounds, any aromatic basic compounds, any alicyclic basic compounds, and a diverse scope of acyclic basic compounds. Moreover, as the molecular weight varies substantially, therefore, not all basic compounds are liquid and also more than routine experimentation is involved. See In re Armbruster 185 USPQ 204 (CCPA 1985) and Angstadt et al., 190 USPQ 152 (CCPA 1990).

Claims 3 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "the " in the b value. There is insufficient antecedent basis for this limitation in the claim.

A term "b value" and "an L value" are written. However, they are vague and indefinite. They do not describe the meanings of those values. Furthermore, claim 11 is generally narrative and indefinite, failing to conform with current U.S. practice. It appears to be a literal translation into English from a foreign document and is replete with grammatical and idiomatic errors. A term "an L value" is written. However, an article "an" is not proper. Therefore, an appropriate correction is required.

***Claim Rejections - 35 USC § 102***

**2113 Product-by-Process Claims**

**PRODUCT-BY-PROCESS CLAIMS ARE NOT LIMITED TO THE MANIPULATION OF THE RECITED STEPS, ONLY THE STRUCTURE IMPLIED BY THE STEPS**

“Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 77 F.2d 695,698,227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted) (Claim was directed to a novolac color developer. The process of making the developer was allowed. The difference between the inventive process and the prior art was the addition of metal oxide and carboxylic acid as separate ingredients instead of adding the more expensive prereacted metal carboxylate. The product-by-process claim was rejected because the end product, in both the prior art and the allowed process, ends up containing metal carboxylate. The fact that the metal carboxylate is not directly added, but is instead produced in-situ does not change the end product.).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Gallagher (WO 97/49652).

Gallagher discloses common reaction products resulted from depolymerization of polyesters , such as dimethyl terphthalate, terephthalic acid, 1,3-propanediol, and etc. (see page 5 ,lines 4-10); furthermore, complete depolymerization will yield monomers ( terephthalic acid and ethylene glycol for polyethylene terephthalate and hexamethylene diamine and adipic acid for nylon 6,6). In addition, polyesters may be recycled by various methods to yield useful polymers (see page 1 ,lines 27-28). In addition, This is identical with the claims.

***Claim Rejections - 35 USC § 103***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher (WO 97/49652).

Gallagher discloses a process of producing common reaction products resulted from depolymerization of polyesters ( e.g., polypropylene terephthalate) (see page 4 ,lines 4-5), such as dimethyl terphthalate, terephthalic acid, 1,3-propanediol, and etc. (see page 5 ,lines 4-10). Furthermore, polyesters may be recycled by various methods to yield useful polymers (see page 1 ,lines 27-28). During depolymerization of polyesters, a depolymerization agent , such as methanol, water or ammonia (see page 7, lines 23-24) may be employed within a temperature range of 140 to 350<sup>0</sup> C. (see page 3, lines 20-22).

However, the instant invention differs from the reference in that the starting material is polytrimethylene terephthalate and the reaction is conducted at a pH of 7-14.

With respect to polytrimethylene terephthalate as the starting material for the process, the reference does not exemplify the polytrimethylene terephthalate in the process of producing monomers. However, the Gallagher does indicate the applicability of the polypropylene terephthalate to the process, which is structurally similar to the claimed polytrimethylene terephthalate. The only difference between them is hydrogen. Therefore, it would have been obvious to the skillful artisan in the art to have motivated to use polytrimethylene terephthalate as an alternative to the polypropylene terephthalate polyester in the Gallagher process. This is because the skillful artisan in the art would expect depolymerization of polytrimethylene terephthalate to produce the monomers similar to those produced by that of the polypropylene terephthalate.

Concerning the reaction conducted at a pH of 7-14, the limitation of a process with respect to ranges of pH, time and temperature does not impart patentability to a process when such values are those which would be determined by one of ordinary skill in the art in achieving optimum operation of the process. pH is well understood by those of ordinary skill in the art to be a result-effective variable, especially when attempting to control selectivity of a chemical process. Therefore, it would have been obvious to the skillful artisan in the art to have motivated to optimize the pH range by routine experimentation in the Gallagher process. This is because the skillful artisan in the art would expect to increase the yield of the monomers by the pH manipulation.

Gallagher does disclose the process of producing common reaction products resulted from depolymerization of many polyesters including polypropylene



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terephthalate and polytrimethylene terephthalate. The Gallagher does indicate the applicability of the polypropylene terephthalate to the process, which is structurally similar to the claimed polytrimethylene terephthalate. The only difference between them is hydrogen. Therefore, it would have been obvious to the skillful artisan in the art to have motivated to use polytrimethylene terephthalate as an alternative to the polypropylene terephthalate polyester in the Gallagher process. This is because the skillful artisan in the art would expect depolymerization of polytrimethylene terephthalate to produce the monomers similar to those produced by that of the polypropylene terephthalate.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Siggel et al (U.S. 2,884,443) teaches a process for regeneration of terephthalic acid dimethyl ester from polyethylene terephthalate at a temperature of from 100 to 210<sup>0</sup> C. and a pressure of from 10 to 19 atmospheres.

Michel (U.S. EP0484963 A2)) teaches a preparation for obtaining dimethyl terephthalate and glycol vapor by treating thermoplastic polyester polymer scrap with excess methanol vapor at a temperature above 230<sup>0</sup> C.

Ligorati et al (U.S. 3,776,945) teaches a process for recovering dimethyl terephthalate and glycol from polyethylene terephthalate by depolymerizing in methanol, instantaneous evaporation after removal of the methanol at a temperature of from 100 to 300<sup>0</sup> C. and a pressure of from 1 to 150 atmospheres.

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Gallagher (U.S. 5,532,404) teaches a process for recovering reaction products from polymers, such as polyesters or polyamides by depolymerization and vapor extraction at a temperature of from 250 to 300<sup>0</sup> C. and a pressure of from 1 to 50 psig .

Barkey et al (U.S. 3,488,298) teaches a process for degrading the polyester with a lower alkyl alcohol and subsequently recovering glycol, dicarboxylic diester, and alcohol from the resulting reaction mixture by distillation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 703-305-0809. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alan Rotman can be reached on 703-308-4698. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-2742 for regular communications and 703-305-7401 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235.

*[Handwritten signature]*  
1/11/03

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